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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/780,428

02/17/2004

Geoffrey David Bootle

DP-307793

2019

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DAVID P. WOOD
DELPH TECHNOLOGIES, INC.
Legal Staff, Mail Code: 480-410-202
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EXAMINER

HAMO, PATRICK

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

10/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/780,428

Applicant(s)

BOOTLE, GEOFFREY DAVID

Examiner

Patrick Hamo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5 and 7-12 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5 and 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

This action is in response to amendments filed on August 6, 2007.

Claim Objections

Claims 1, 5 and 7-12 are objected to because of the following informalities: the plural of the singular axis may be written as either axes or, preferably, axes. According to the remarks presented with the amendments, the examiner believes "the respective bore axis being oriented along a common bore axis plane" should be changed to --the respective bore axes being oriented along a common bore axis plane--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 6, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sobek, 2,313,302 in view of Buckley, 5,613,839.

Sobek discloses a pump for pumping fluid with a first plunger 6 and a second plunger 5 each within a bore 2, 3, respectively, within a housing wherein the plungers with the bore define a pumping volume (see figs. 2-5), an inlet port 20 and an outlet port 21, an end of the first plunger arranged to cover the inlet during discharge and an end of

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the second plunger arranged to cover the outlet during intake, and each covering their respective ports in an intermediate stage (p. 1, col. 2, ll. 38-50), and there inherently being moments when the inlet and outlet ports are only partially covered.

Sobek does not disclose the respective plunger bores being in communication with one another by way of a connecting passage, two or more pairs of plungers, wherein each pair is aligned along a respective common bore axis, the bore axes being oriented along a common bore axis plane, wherein the two or more pairs of plungers are driven by means of a single cam ring that is configured to rotate about an axis of rotation oriented substantially transverse to said common bore axis plane.

However, Buckley teaches a variable rate pump with two pairs of plungers (one pair in the left-to-right direction and one in the top-to-bottom direction of fig. 3), each pair aligned along a common bore axis, and the two axes being in a substantially planar field (that of the cross-section of fig. 3), and a single cam ring 32 driving the plungers with an axis of rotation transverse to the bore axis plane as defined by the planar field of the cross-section of fig. 3, and a communication path 40 (see fig. 1) connecting the respective plunger bores 16 of the first and second plungers of a given plunger pair. The invention of Buckley allows the pump to vary the pumping rate for a particular speed of rotation in order to meet emissions regulations (col. 1, ll. 41-43).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the pump of Sobek with the cam actuation and multiple plunger pairs of Buckley in order to better vary the pumping rate.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Babitzka, 4,709,673.

The references as applied to claim 1 above teach all the limitations substantially as claimed except for the following taught by Babitzka: two pairs of plungers 7, 9 aligned along two common axes 6, 8, driven by a single cam ring 31, the two pairs of plungers offset by 135° in order to optimize the supply rate of the individual partial injections of the two sets of plungers (col. 1, ll. 26-29).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 1 above with Babitzka in order to optimize the supply rate of injection (col. 1, ll. 26-29).

Furthermore, in regards to the claim limitations regarding pumping cycle phases of 115° to 130°, 120°, and 130°, the optimal figure for the phase difference is a matter of routine experimentation and therefore the difference between these values and that of the prior art fails to patentably support the claimed limitations in view of MPEP §2144.05(2)(a).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Cooke, 5,884,608.

The references as applied to claim 1 above teach the invention substantially as claimed except for the following taught by Cooke: a transfer pump (col. 5, ll. 49-50) for supplying fuel to a fuel inlet 48 of a fuel pump. Thus it would have been obvious to one having ordinary skill in the art at the time of the invention to supply fuel to the fuel pump

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of the references as applied to claim 1 using a transfer pump as taught by Cooke since the operation of the transfer pump is not dependent on the operation of the fuel pump, and the transfer pump in combination would achieve the predictable result of transferring fuel to the fuel pump.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Jay, 6,240,901.

The references as applied to claim 1 above teach the invention substantially as claimed except for the following taught by Jay: a common rail fuel pressurization system (col. 1, ll. 26-27) that uses higher pressure pumps and separates the process of pressure generation and fuel injection to make the fuel pumping process less expensive and inject more uniformly (col. 1, ll. 13-37).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Sobek with Jay in order to make the fuel pumping process less expensive and inject more uniformly (col. 1, ll. 13-37). It would have been obvious to one of ordinary skill in the art that this modification would include connecting an outlet of the pump of Sobek in view of Buckley with the common rail fuel delivery system of Jay.

Response to Arguments

Applicant's arguments with respect to claims 1, 5 and 7-12 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Hamo whose telephone number is 571-272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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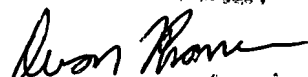
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PH

Devon Kramer
Supervisory Patent Examiner
Art Unit 3746

DEVON C. KRAMER
PATENT EXAMINER


10/22/07